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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,485	05/03/2006	Harald Fischer	CH 020030	4979

7590 12/15/2006  
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EXAMINER

NGUYEN, TUAN HOANG

ART UNIT	PAPER NUMBER
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2618

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/525,485

Applicant(s)

FISCHER, HARALD

Examiner

Tuan H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 20-23, and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Heinonen, Jarmo (European Patent Application EP 0 800 283 hereinafter, "Heinonen").

Consider claim 1, Heinonen teaches transceiver apparatus for use in a multi-frequency communication system, comprising: a signal processor a frequency conversion circuitry an antenna-switch (see fig. 1 col. 1 line 55 through col. 2 line 3 and fig. 2 col. 2 lines 29-33 and col. 3 lines 45-48), and an antenna terminal having at least one antenna characterized in that the frequency conversion circuitry has a transmission

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path and a reception path, wherein each of the paths communicatively connects the signal processor and the antenna-switch (see fig. 2 col. 2 line 29 through col. 3 line 48), the antenna-switch comprises a multi-switch, a transmission-multiplexer and a reception multiplexer, wherein said multiplexers are controllable by the signal processor via the multi-switch (see fig. 2 col. 2 line 29 through col. 3 line 48), the antenna has a transmission-connector for connecting the transmission path to the antenna and a reception-connector for connecting the reception path to the antenna (see fig. 2 col. 2 line 29 through col. 3 line 48), wherein the antenna-switch, controllable by the signal processor, allows multi-frequency operation of the antenna-terminal by combining a transmission-mode and a reception-mode of the antenna (see fig. 2 col. 2 line 29 through col. 3 line 48).

Consider claim 2, Heinonen further teaches characterized in that the signal processor is an analogue-digital signal processor formed by a direct digital synthesizer driven phase locked loop radio frequency signal generator (col. 8 line 50 through col. 9 line 7).

Consider claim 3, Heinonen further teaches characterized in that the frequency conversion circuitry comprises at least one of a local oscillator and a power divider to supply a local oscillator power to the transmission path and/or the reception path (col. 8 line 50 through col. 9 line 7).

Consider claim 4, Heinonen further teaches characterized in that the frequency conversion circuitry comprises a mixer device for converting the signal between an intermediate frequency and a radio frequency (col. 6 lines 21-30).

Consider claim 5, Heinonen further teaches characterized in that the frequency conversion circuitry comprises a direct conversion device for converting the signal between a base band frequency (zero IF) and a radio frequency, in particular by means of an IQ-method (col. 6 lines 7-20).

Consider claim 20, Heinonen teaches a method of transceiving a multi-frequency signal in a multi-frequency communication system, comprising the steps of: processing the signal in a signal processor frequency converting the signal in a frequency conversion circuitry operating an antenna terminal by an antenna-switch (see fig. 1 col. 1 line 55 through col. 2 line 3 and fig. 2 col. 2 lines 29-33 and col. 3 lines 45-48), and transceiving the signal by means of at least one antenna of the antenna terminal characterized in that frequency converting of the signal in the frequency conversion circuitry is established on a transmission path and a reception path, wherein each of the paths communicates the signal between the signal processor and the antenna switch (see fig. 2 col. 2 line 29 through col. 3 line 48), multi-frequency antenna terminal operation is established by combining a transmission-mode of the antenna and a reception-mode of the antenna, controlled by the signal processor, by means of: the antenna-switch which comprises a multi-switch, a transmission multiplexer and a

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reception multiplexer, wherein the multiplexers are controlled by the signal processor via the multi-switch (see fig. 2 col. 2 line 29 through col. 3 line 48), and communicating the signal between the transmission path and the antenna via the transmission multiplexer and a transmission connector of the antenna and between the reception path and the antenna via the reception multiplexer and a reception connector of the antenna (see fig. 2 col. 2 line 29 through col. 3 line 48).

Consider claim 21, Heinonen further teaches characterized by directly frequency converting the signal in a frequency conversion circuitry between a base band signal (zero IF) and a radio frequency signal (col. 6 lines 7-20).

Consider claim 22, Heinonen further teaches characterized by frequency converting the signal in a frequency conversion circuitry between an intermediate frequency signal and a radio frequency signal (col. 6 lines 21-30).

Consider claim 23, Heinonen further teaches characterized in that a reference of an incoming signal is processed in an antenna switch after checking a beam direction and a signal quality, in particular based on a BER-measurement (col. 1 line 53 through col. 2 line 3 e.g., digital processing included BER measurement to check a signal quality of an incoming signal).

Consider claim 26, Heinonen further teaches in a multi-frequency communication system, in particular in a personal communication system, in particular in a personal communication system having a mode selected from the group consisting of: PCS/N, 3G and GSM (col. 2 line 29 through col. 3 line 3).

Consider claim 27, Heinonen further teaches in a 3G/GSM multi-mode or combined system (col. 2 lines 49-55).

Consider claim 28, Heinonen further teaches in a mobile cellular communication system in combination with a personal communication system (col. 2 lines 49-55).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen in view of Garlepp et al. (U.S. PUB. 2003/0017809 hereinafter, "Garlepp").

Consider claim 6, Heinonen teaches transceiver apparatus for use in a multi-frequency communication system.

Heinonen does not explicitly show that characterized in that the antenna switch comprises a matching unit formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna.

In the same field of endeavor, Garlepp teaches characterized in that the antenna switch comprises a matching unit formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna (page 17 [0189]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, characterized in that the antenna switch comprises a matching unit formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna, as taught by Garlepp, in order to provide impedance matching in the front-end circuitry of RF apparatus.

Consider claim 7, Garlepp further teaches characterized in that the antenna switch comprises a bus connection to the signal processor, wherein the bus-connection is formed as a matching network (page 1 [0007]).

Consider claim 10, Garlepp further teaches characterized in that the antenna terminal comprises a patching unit formed as a low-pass-filter to improve the matching of the antenna for different frequencies and/or for different modes of a multi-frequency communication system, in particular of a mobile cellular communication system or a



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personal communication system (page 21 [0241]).

Consider claim 11, Garlepp further teaches characterized in that the antenna terminal comprises a matching unit for the antenna, in particular an LC component, in order to provide an optimal matching factor for the antenna (page 22 [0275]).

6. Claims 8-9, 12,16-19, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen in view of Keskitalo et al. (U.S PAT. 6,128,486 hereinafter, "Keskitalo").

Consider claim 8, Heinonen teaches transceiver apparatus for use in a multi-frequency communication system.

Heinonen does not explicitly show that characterized in that the antenna switch further comprises a beam forming matrix device, in particular a Butler-output-matrix selected from the group consisting of: a 4x4, a 8x8 and a 16x16 Butler output matrix.

In the same field of endeavor, Keskitalo teaches characterized in that the antenna switch further comprises a beam forming matrix device, in particular a Butler-output-matrix selected from the group consisting of: a 4x4, a 8x8 and a 16x16 Butler output matrix (col. 9 lines 6-23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, characterized in that the antenna switch further comprises a beam forming matrix device, in particular a Butler-output-matrix selected

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from the group consisting of: a 4x4, a 8x8 and a 16x16 Butler output matrix, as taught by Keskitalo, in order to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector.

Consider claim 9, Keskitalo further teaches characterized in that matching units are provided inside the Butler-matrix, in particular a modified Butler-output matrix output/input is formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna (col. 1 lines 36-46).

Consider claim 12, Keskitalo further teaches characterized in that the antenna terminal comprises at least two, in particular four, antennas (col. 3 line 63 through col. 4 line 12).

Consider claim 16, Keskitalo further teaches characterized in that the antenna has a body and the body comprises an integrated patching and/or matching unit (col. 1 lines 36-46).

Consider claim 17, Keskitalo further teaches characterized in that the antenna terminal forms a beam of 360 degrees, in particular the antenna beam is formed within a range of 200 degrees (col. 2 lines 18-37).

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Consider claim 18, Keskitalo further teaches characterized in that the antenna beam comprises a 90 degree beam, in particular the beam is formed by a 50 degree main beam and two 20 degree side beams (col. 2 lines 18-37).

Consider claim 19, Keskitalo further teaches a base station for use in a multi-frequency communication system, comprising a transceiver apparatus (col. 1 lines 13-23).

Consider claim 24, Keskitalo further teaches in a multi-frequency communication system, in particular in a mobile cellular communication system, in particular a mobile cellular communication system having a mode selected from the group consisting of: CDMA, FDMA and TDMA (col. 1 lines 47-65).

Consider claim 25, Keskitalo further teaches in a CDMA-FDMA/TDMA and/or FDMA/TDMA (2.5G) multi-mode or combined system (col. 1 lines 13-23).

7. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinonen in view of Cencich et al. (U.S PAT. 6,844,862 hereinafter, "Cencich").

Consider claim 13, Heinonen teaches transceiver apparatus for use in a multi-frequency communication system.

Heinonen does not explicitly show that characterized in that the antenna is formed as an s-loop antenna having two ends formed as the transmission connector and/or the reception connector.

In the same field of endeavor, Cencich teaches characterized in that the antenna is formed as an s-loop antenna having two ends formed as the transmission connector and/or the reception connector (col. 2 lines 40-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, characterized in that the antenna is formed as an s-loop antenna having two ends formed as the transmission connector and/or the reception connector, as taught by Cencich, in order to provide an antenna that provides high gain and wide-angle coverage with reduced size and weight, and that is particularly apt for spaceborne applications.

Consider claim 14, Cencich further teaches characterized in that the antenna is configured as a copper wired antenna, in particular as a flexible line antenna made of copper (col. 5 lines 32-39).

Consider claim 15, Cencich further teaches characterized in that the antenna is configured as a SMD-planar antenna (col. 5 lines 6-15).

### ***Conclusion***

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8. Any response to this action should be mailed to:

Mail Stop \_\_\_\_\_ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

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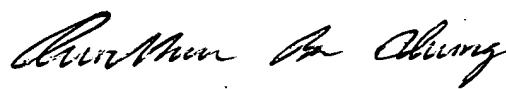
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information Consider the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

T-  
Tuan Nguyen  
Examiner  
Art Unit 2618

 12/11/06  
QUOCHIEB B. VUONG  
PRIMARY EXAMINER